

Claims 1 to 22 have been canceled, without prejudice. Applicant expressly reserves the right to seek patent protection for these or similar claims in one or more later filed related applications.

New claims 23 to 47 have been added and are directed to embodiments for which patent protection is sought. Claims 23 to 47 have been presented to more clearly define the present invention, to address the rejection under 35 U.S.C. 112, second paragraph, and in general, to facilitate the prosecution of the above-identified application. Each of these new claims is fully supported by the present specification.

In view of the new claims 23 to 47, applicant respectfully requests that the rejection under 35 U.S.C. 112, second paragraph, be withdrawn.

Applicant gratefully acknowledges the Examiner's holding that claims 6 and 10 include allowable subject matter.

Claims 1 to 5, 7, 9, 11, 13 and 15 to 22 have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mitchell et al. Claims 8, 9, 12 and 14 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al in view of Morishita et al. Claim 14 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al in view of Hienstand et al. Applicant traverses each of these rejections as it pertains to new claims 23 to 47.

The present invention is directed to controlled release additive compositions for use in open circulating cooling water systems and to methods for using such compositions.

In independent claim 23, the controlled release additive compositions for use in open circulating cooling water systems comprise a core and a coating substantially surrounding the core. The core comprises an additive component including a microbiocide effective in an open circulating cooling water system. The coating

is effective to slow the release of the additive component into the open circulating cooling water system. The coating is insoluble in the open circulating cooling water system and includes a polymer made up of units from no more than two monomers.

In independent claim 38, a controlled release additive composition for use in an open circulating cooling water system comprises a core and a coating substantially surrounding the core. The core comprises an additive component effective in an aqueous coolant of an open circulating cooling water system. The coating is effective to slow the release of the additive component into the open circulating cooling water system. The coating includes a polymer selected from homopolymers, and copolymers including units obtained from only two different monomers, provided that one of the two different monomers is selected from vinylversatate and ethylene.

The present methods, as recited in claims 46 and 47, for releasing additive composition into an open circulating cooling water system comprise placing the present controlled release additive compositions in contact with an aqueous coolant present in an open circulating cooling water system.

The present invention has been found to be very effective in releasing, on a controlled basis, additive component, preferably including a microbiocide, into a cooling open circulating cooling water system. Such open circulating cooling water systems, for example, cooling towers, are distinguished from engine cooling systems, such as diesel engine cooling systems, which are closed. For example, the present open circulating cooling water systems, by definition, are open to the atmosphere, whereas engine cooling systems are closed and often pressurized to operate at high temperatures, for example, often above the normal boiling point of water.

Open circulating cooling water systems are often maintained at temperatures well below the normal boiling point of water, for

example, in a range of about 70°F or about 80°F to about 100°F or about 150°F. Such open circulating cooling water system temperatures are substantially below temperatures normally present in engine cooling systems. This difference is important in that the coating of the present composition is both insoluble in the open circulating cooling water system and also sufficiently permeable to effect controlled release of the additive component.

Applicant has found that the present compositions are effective both to provide a coating which is insoluble in the open circulating cooling water system, and to provide for slowed or controlled release of the additive component into the open circulating cooling water system at the relatively low temperature (as compared to temperatures in an engine cooling system) present in an open circulating cooling water system.

Mitchell et al discloses a controlled release coolant additive for use in diesel engine coolant systems comprising a core containing at least one additive in a polymeric coating material encapsulating the core. Mitchell et al discloses a series of specific polymer compositions, the vast majority of which are terpolymers, that is polymers made up of units from three monomers. The only homopolymer disclosed by Mitchell et al, polystyrene, is disclosed as not being effective. Among the two copolymers disclosed tested by Mitchell et al, one of the copolymers was too sticky and therefore not acceptable. Mitchell et al claims only specific terpolymer compositions.

Mitchell et al does not disclose, teach or suggest the present invention. For example, Mitchell et al does not disclose, teach or even suggest a controlled release additive composition for use in an open circulating cooling water system or methods for using such compositions in an open circulating cooling water system, as recited in the present claims. In addition, Mitchell et al does not disclose, teach or even suggest a composition including a core and a coating in which the core includes a microbiocide effective

in an open circulating cooling water system and a coating effective to slow the release of the additive component into an open circulating cooling water system and made up of units from no more than two monomers, as recited in claim 23.

Further, Mitchell et al does not disclose, teach or even suggest a controlled released additive composition for use in an open circulating cooling water system including a core comprising an additive component effective in an aqueous coolant of an open circulating cooling water system, and a coating substantially surrounding the core effective to slow the release of the additive component into the open circulating cooling water system and including a polymer selected from homopolymers and copolymers including units obtained from only two different monomers, at least one of which is selected from vinylversatate and ethylene, as recited in claim 38.

Although Mitchell et al incidently mentions microbiocides from a historical point of view in the background of the invention, Mitchell et al does not even suggest that such materials are to be used in the disclosed diesel engine coolant additive compositions. Microbiocides are not needed in diesel engine coolant additive compositions because microorganisms cannot exist in such systems, for example, because of the high temperatures involved and/or the composition of the coolant. The fact that no microbiocide is disclosed in the engine coolant additive compositions disclosed by Mitchell et al make clear that the present invention, for example as recited in claim 23, is clearly distinguished from the teachings of Mitchell et al.

To a large extent, Mitchell et al actually teaches away from the composition recited in claim 23. This is particularly true since the vast majority of coating materials tested, and the only coating materials claimed, in Mitchell et al involve polymers made from three monomers. In addition, the only homopolymer tested by Mitchell et al, that is polystyrene, was not acceptable. This is

in direct contrast to the present invention in which the coating includes a polymer made up of units from no more than two monomers, as recited in claim 23.

With regard to independent claim 38, Mitchell et al does not even suggest a coating including a polymer selected from homopolymers and copolymers including units obtained from only two different polymers and monomers in which one of the monomers is selected from vinylversatate and ethylene. The only two monomer copolymers disclosed by Mitchell et al, that is vinylacetate-ethylacrylate and vinylacetate-dibutylmaluate, are not included in the compositions set forth in claim 38. In addition, as noted above, Mitchell et al discloses that only one of these two monomer copolymers is acceptable for use in diesel engine cooling system service. Also, the only homopolymer disclosed by Mitchell et al, that is polystyrene, is not acceptable for use in diesel engine cooling system service.

In short, Mitchell et al discloses a different composition, for example, compositions which do not include in microbiocide and/or which do not include polymers made from only two different monomers such as copolymers in which one of the monomers is selected from vinylversatate and ethylene, as recited in the present claims. Moreover, Mitchell et al is directed to a different application, diesel engine coolant systems, rather than open circulating cooling water systems, as recited in the present claims. Thus, Mitchell et al discloses different compositions for different applications relative to the present claims. Such differences clearly distinguish the present invention from Mitchell et al. As noted above, Mitchell et al actually teaches away from the present invention.

In view of the above, applicant submits that the present claims 23 to 47 are not anticipated by and are unobvious from and patentable over Mitchell et al under 35 U.S.C. 102(b) and 103(a).

The Examiner relies on Morishita et al to supply the

deficiencies apparent in the teachings of Mitchell et al.

Morishita et al discloses various cellulose derivatives, including ethylcellulose, as examples of semipermeable wall materials for medicaments in the gastrointestinal tract.

Morishita et al does not disclose, teach, or even suggest the present invention. For example, Morishita et al has absolutely nothing to do with controlled release additive compositions for use in open circulating cooling water systems, as recited in the present claims. Moreover, Morishita et al has absolutely nothing to do with compositions for release of additive compositions for use in diesel engine cooling systems, as in Mitchell et al. The use of a wall in medicaments for use in the gastrointestinal tract of a human or animal provides no proper basis for using such composition or any component thereof in either an open circulating cooling water system or a diesel engine cooling system.

The combination of Mitchell et al and Morishita et al provides no motivation or incentive to one of ordinary skill in the art to combine the teachings of these two very different references for any purpose, let alone for the purpose of making obvious the present invention. Simply put, the teachings of Mitchell et al and Morishita et al are substantially different and distinct one from the other, for example, discloses different compositions, different applications, and achieving different results.

Applicant submits that there is no basis, other than an improper hindsight view of applicant's own disclosure and invention, for combining the teachings of these two references.

In view of the above, applicant submits that the present claims, that is claims 23 to 47, are unobvious from and patentable over Mitchell et al in view of Morishita et al under 35 U.S.C. 103(a).

The Examiner further relies on Hienstand et al to supply the deficiencies apparent in the teachings of Mitchell et al.

Hienstand et al discloses a process for precoating of liquid

and solid hydrophilic materials by phase separation from non-aqueous media prior to coating by phase separation from aqueous media. Hienstand et al discloses using a two-layer coating in the cosmetic field, and in the agricultural field. Heistand et al discloses the use of the derivatives of naturally occurring polymers, such as ethylcellulose.

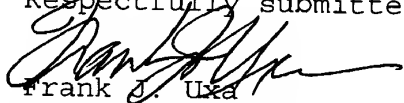
Hienstand et al does not disclose, teach, or even suggest the present invention. For example, Hienstand et al has absolutely nothing to do with either controlled release additive compositions for use in open circulating cooling water systems, as recited in the present claims, or compositions for use in diesel engine cooling systems, as recited in Mitchell et al. Neither Mitchell et al nor Heinstand et al provide any motivation or incentive to one of ordinary skill in the art to combine the teachings of these two references for any purpose, let alone for the purpose of making obvious the present invention. The compositions and applications disclosed by Mitchell et al and Heinstand et al are substantially different and distinct one from the other. The only basis on which the teachings of these two very different references can be combined is an improper hindsight view of applicant's own disclosure and invention.

In view of the above, applicant submits that the present claims, that is claims 23 to 47, are unobvious from and patentable over Mitchell et al in view of Heinstand et al under 35 U.S.C. 103(a).

Each of the present dependent claims is separately patentable over the prior art. For example, none of the prior art, taken singly or in any combination, disclose, teach or even suggest the present compositions and methods, including the present compositions and methods including the additional feature or features recited in any of the present dependent claims. Therefore, applicant submits that each of the present claims is separately patentable over the prior art.

In conclusion, applicant has shown that the present claims, that is claims 23 to 47, are not anticipated by and are unobvious from and patentable over the prior art under U.S.C. 102 and 103. Therefore, applicant submits that the present claims are allowable and respectfully requests the Examiner to pass the above-identified application to issuance at an early date. Should any matters remain unresolved, the Examiner is requested to call (collect) applicant's attorney at the telephone number given below.

Respectfully submitted,



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